MARINE REVIEW.

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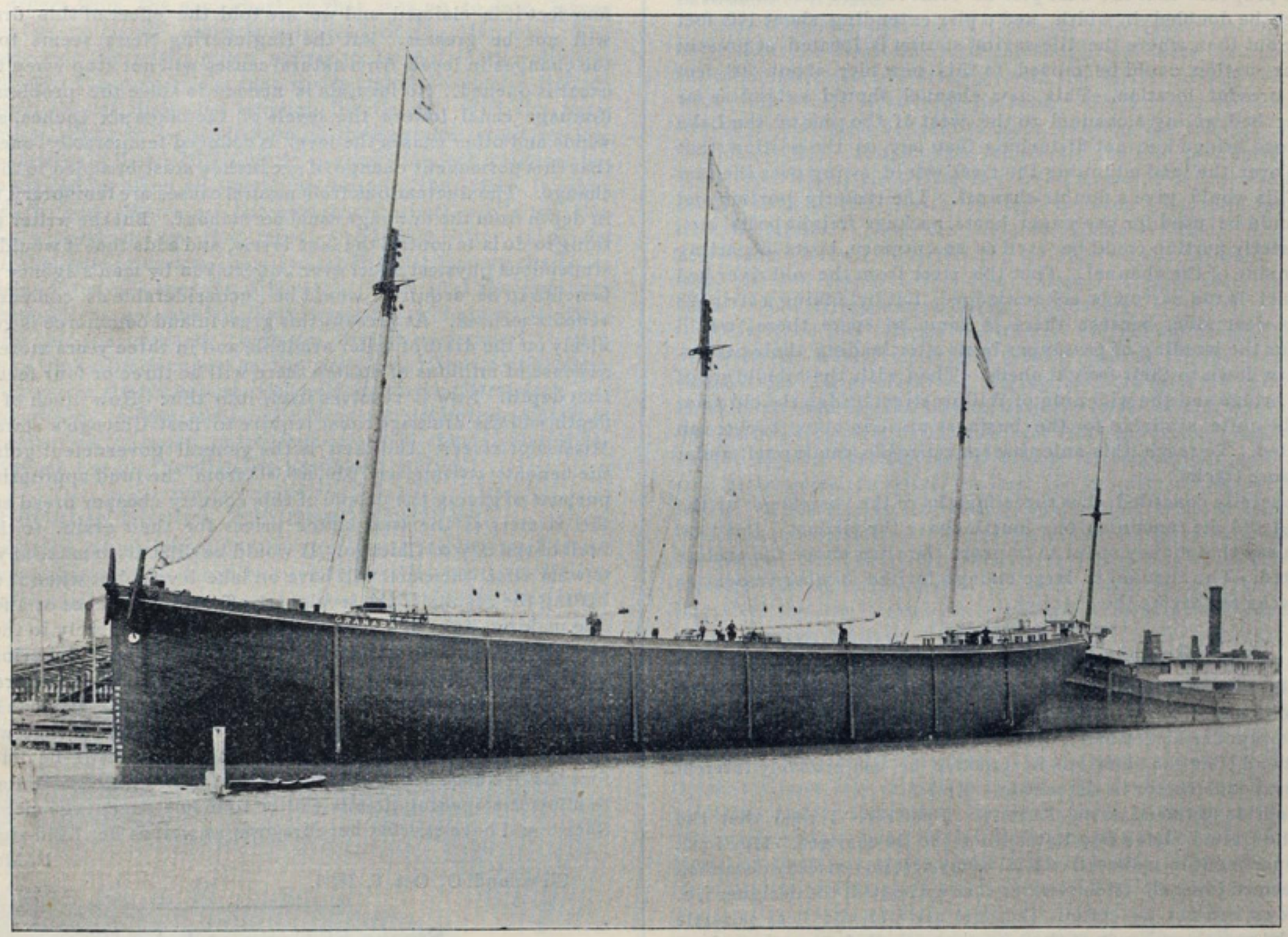
Largest Wooden Consort in the World.

The illustration herewith shows the schooner Granada, built by Capt. James Davidson, West Bay City, it being so far as known the largest wooden consort in the world. The schooner is 255 feet long, 41 feet beam, and 21 feet 4 inches depth of hold in shoalest place. She has eight cargo hatches, all spaced 24 feet centers. She is a double deck schooner, having between deck beams, but no between decks are laid. She was built with steel keelson plates on each side of her main keelson, which are 18 inches by 1 inch and she has steel cords, steel arches and steel straps. She has an American Ship Windlass Co., steam windlass and steam capstan, and both wildcats are fitted for 1¾-inch stud linked chain. She has immense anchors, and heavy chains, capable of holding in any storm if she should be cast adrift. A large pony boiler supplies steam for windlass, steam deck hoist, and steam pumps. Her capacity is 100,000 bushels of wheat from Chicago, and she rates A1* in the Inland Lloyd's, and has the highest class in the standard register of the United States Standard Register of New York.



LARGEST WOODEN CONSORT IN THE WORLD.

Lake Freight Matters.

The first break in lake freights in over two weeks of steady advance occurred Wednesday. The Escanaba rate went down 15 cents. The day before some boats had to be hau ed off the market to keep it from falling, but the slight decline in Chicago grain to 3¼ cents and scarcity of cargoes, frightened the party who had the boats and a few were put in at $1.10 to Escanaba. It furnishes a bad precedent for the head of the lakes rate, but the fact that there is considerable ore to come down from the head of the lakes will strengthen the grain rate, which is moderately strong in itself. There seems to be a quiet combination among shippers of ore to hold off and bring about the same result in the Lake Superior rates that was obtained in the Escanaba rates. A few brokers who have conflicting interests would welcome this state of affairs but it is thought that they can not control enough boats to supply the demand even if a slight slump should occur. There is a probable blockade at Buffalo to be considered. Between that and the amount of ore, grain and coal that must be moved, holding off for $1 to Escanaba and $1.50 to the head of the lakes may prove expensive. As long as 5½ cents and a fair amount of grain is the situation at Duluth, $1.75 ought to hold good on ore. It is believed that ore shippers are more anxious to break the head of the lakes ore rate than they were the Escanaba rate. Reports of large amounts of ore for shipment at different Lake Superior ports should bring about a tug of war as to whether $1.75 or a reduced rate will be paid on quite a number of boats Reports from the northwest show that there is an increasing demand for coal and the fact that boats are going up light strengthens the coal situation. While Chicago and the west can be supplied by rail, the northwest has to get coal by lake or do without. Lake Michigan 65 cents and Duluth 35 cents, from all ports except Buffalo, from which 80 cents is paid to Milwaukee, and 90 cents to Chicago, are the ruling rates on coal, and there seems to be no inclination to quarrel over them.

Buying Big Boats.

Capt. James Ash has sold the steamer Pascal P. Pratt and consort Annie M. Ash to Capt. W. S. Mack and others of Cleveland. The price is $140,000. The Pratt was built seven years ago by Quayle & Sons at Cleveland, is valued in the Lloyd's register at $100,000 and rates A1 star. The Ash was built in the same place by the same people, is valued at $50,000 and rates A1 star.

The steamer Thomas Davidson, belonging to the estate of the late Thomas Davidson has been sold to a syndicate headed by Henry J. Pauly of Milwaukee and H. W. Cook of Chicago, the latter of the firm of Palmer, Cook & Calbick, vessel and marine insurance agents. While the exact price agreed upon for the transfer of the steamer is not given out, it is said to be a trifle better than $80,000.

Announcement will be made during the coming week of the sale of another large wooden steamer, the price of which will be more than $100,000. Even in the palmy days of 1891 large steamers did not change hands as rapidly as they are doing at present.

Cleveland Harbor Improvement.

Cleveland City Engineer Rawson has submitted a report and a map showing the plan he advocates for the widening of the river between Superior street and the Center street bridge. The line proposed as the west line of the river between these points begins at the west abutment of the draw of the viaduct and passes straight southeast through the abutment at the west arm of the Valley railway bridge and thence to the north end of the protection to the Center street bridge. It is proposed to change the bridge at Center street to a swing bridge with an arm across the river 130 feet in length and the west arm 100 feet in length. This will give a channel at that point 100 feet in width and will also give a channel on both sides of the middle pier of the viaduct. From the viaduct north the same line as has been given was on the map, cutting off the corner of land just north of the viaduct.

The question arose at the meeting as to the weakening of the viaduct if the channel should be run on the west side of the middle pier and the engineer said that was the most serions problem they would have to consider and it was a serious problem indeed.

With such progress toward the widening of the river the commission thought steps should be taken toward securing the necessary legislation on the subject and the authority to issue bonds. Such legislation is desired at the opening session of the legislature and a committee was appointed to introduce the law among the first.

A well-known marine man who is engaged in business on the river every day makes the following suggestion for the improvement of the harbor. He proposes that the west pier be removed and the channel at the entrance be doubled in width, and a pier extending about 100 feet feet farther out than where the life-saving station is located at preseni and then the station could be moved to this new pier about 200 feet west of its present location. This new channel should extend as far as the river bed, giving a channel to the west of the pier of the Lake Shore railroad bridge but not disturbing that any, as the portion that now swings over the land adjoining the river would swing over the new channel. This would give a double channel. The easterly portion and east piers could be used for passenger boats, package freight boats, etc., and the westerly portion could be used as an entrance, boats departing using either side of the channel. That the river from the old river bed to the viaduct is too narrow is acknowledged, but by taking a strip 28 feet off the west side, because there is room to spare there, would give room for the winding of passenger boats after landing their passengers to return down to their freight sheds. Then with the rebuilding of the railway bridge and the widening of Willow street bridge the old river bed would be quite available for the business until an outer harbor can be constructed. To reach this outer harbor railroads can tunnel under the Lake Shore tracks.

It is generally conceded that three-fourths of the vessels go up the old river bed and the remaining one-fourth above the viaduct. Practical marine men say that money spent to improve the river above the viaduct will be wasted. The channel is large enough for the lumber vessels to reach the docks farther up the channel.

Screws of the Katahdin.

The following communication is from a prominent English inventor. The system he mentions as being advantageous for the Katahdin consists of movable propeller blades and a device for adjusting same. The theory is excellent and if he can show one in practice he can probably interest the chief naval constructor in the matter.—ED.]

To the editor of the MARINE REVIEW: Dear Sir.—I read that the screws of the United States ram Katahdin are to be changed. May I ask the navy department to make a free trial of my system—already described in your esteemed journal? It is obvious that without it, the designer i. e. of fixed screws, can not be certain that he has put the best possible screws on the vessel, and even at their best or, shall I say, worst, fixed screws can but suit one condition of running out of very many. How can a fixture of inefficiency economically provide for variations of boiler and engine power, revolutions, fighting and cruising speeds, draught, state of hull, wind or current, etc.? A ram, too, needs direct manipulation from the conning tower; and all the above advantages (with the reversal of nothing but the ship, no delay while twice overcoming the inertia of mass, no sudden checking of steam consumption, and by merely turning water-cushioned blades on their centers) can be alone obtained by my system.

ROBERT MCGLASSON, M. I. M. E.

Selhurst, London, Sept. 27, 1895.

Lake Levels and the Chicago Sewer.

Editor MARINE REVIEW: Engineering News has solved the question of lake levels and the influence of the drainage canal in a short editorial, and it is so simple that it is strange all the engineers who have been pondering over the matter for several years have not struck upon it before. The editorial is as follows:

"It seems sensible, on the whole, therefore, to conclude that while the reduction in lake levels due to the Chicago canal will have some effect on lake shipping interests, the fact will be very far from wholesale destruction which has been pictured. Annual changes in lake levels due to natural causes are several times as great as any which, the drainage canal can cause.

"The only satisfactory solution of the whole problem would seem to be for the United States and Canada to at once determine the feasibility of controlling the levels of all the great lakes and the waterways which issue from them; and unless unforeseen obstacles are found, to enter upon the execution of the work.

"The control of the levels of these great fresh water seas, covering a hundred thousand square miles, would be indeed the most stupendous physical effect ever produced by man's agency, but from present appearances it could be carried out by methods entirely within the precedents of modern engineering and at a cost quite inconsiderable in comparison with the benefits to be secured."

It claims the results will not seriously effect lake shipping interests, for it says the annual changes in the levels are greater than the drainage canal will cause. These annual changes amount to as much as three or four feet it is claimed, and we are told the effect of this drainage canal will not be greater. But the Engineering News seems to forget that the changes in levels from natural causes will not stop when the drainage canal is opened. No formula is needed to solve the problem that if the drainage canal lowers the levels of the lakes six inches, and through winds and other causes the level is reduced temporarily one or two feet, that this permanent change of six inches must be added to the temporary change. The fluctuations from natural causes are temporary, the decrease in depth from the drainage canal permanent. But the writer says that the thing to do is to control the lake levels, and adds that it would be the most stupendous physical effect ever undertaken by man's agency and that the benefits to be acquired would be inconsiderable as compared with the benefits secured. At present this great inland commerce is getting along nicely on the draft of water available and in three years more through an expense of millions of dollars there will be three or four feet more available depth. Now it resolves itself into this: How much of this added depth will the drainage canal require to float Chicago's sewage into the Mississipi river? And then is the general government going to divert the benefits costing, say, $10,000,000 from the fund appropriated for the purpose of giving the people of this country cheaper bread and iron, and the farmers of the west better prices for their grain, to the sewerage fund of the city of Chicago. It would be difficult to make any estimate as to what effect the canal will have on lake levels, but when it comes to belittling the results if the levels are affected six inches or a foot, it looks like making light of a very serious matter, not merely to the owners of $175,000,000 worth of property included in the Lake Superior ore, transportation and dock business of the great lakes, but the entire northwest and in fact every part of this country except the extreme south. The question as to whether the results to be gained by Chicago will compensate for the damage done lake shipping at large will be determined before the drainage canal will be opened. And if the government refuses to allow the opening no one will be to blame except the city of Chicago. She should have exerted her foresight as well as her hind-sight.

F. MORELLE,

Cleveland. O., Oct. 8, 1895.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on Oct. 12, 1895:

	Wheat, bushels.	Corn, bushels.
Chicago	15,501,000	2,821,000
Duluth	5,407,000	.....
Milwaukee	512,000	.....
Detroit	425,000	50,000
Toledo	1,012,000	226,000
Buffalo	2,162,000	227,000
Total	25,019,000	3,324,000

As compared with a week ago, the above figures show at the several points named an increase of 1,365,000 bushels of wheat and 702,000 bushels of corn.

Buy the Best Shafting.

The following brief statement of the Atlanta's accident caused by the breaking of her shaft emphasizes the necessity of obtaining the best material for vital portions of machinery. While accidents will happen to the best of material, still the percentage is so small that it amounts almost to perfection. In the Atlanta's case the breaking of the shaft occurred at a most fortunate time, but usually accidents occur when the boat is being tossed about in a storm and when they prove most disastrous. The shafts of lake steamers are exposed to very severe strains. By reason of the steamer's length in comparison with the length of waves their propellers are thrown out and submerged so quickly that it is very difficult to check the engines in unison and the shaft must bear this torsional strain. It would seem wise to buy the best regardless of cost and if the contract price is too low, economize in the cabin trimmings. For no cabin, no matter how gorgeously fitted, is comfortable while the boat is rolling around in the sea with a broken shaft.

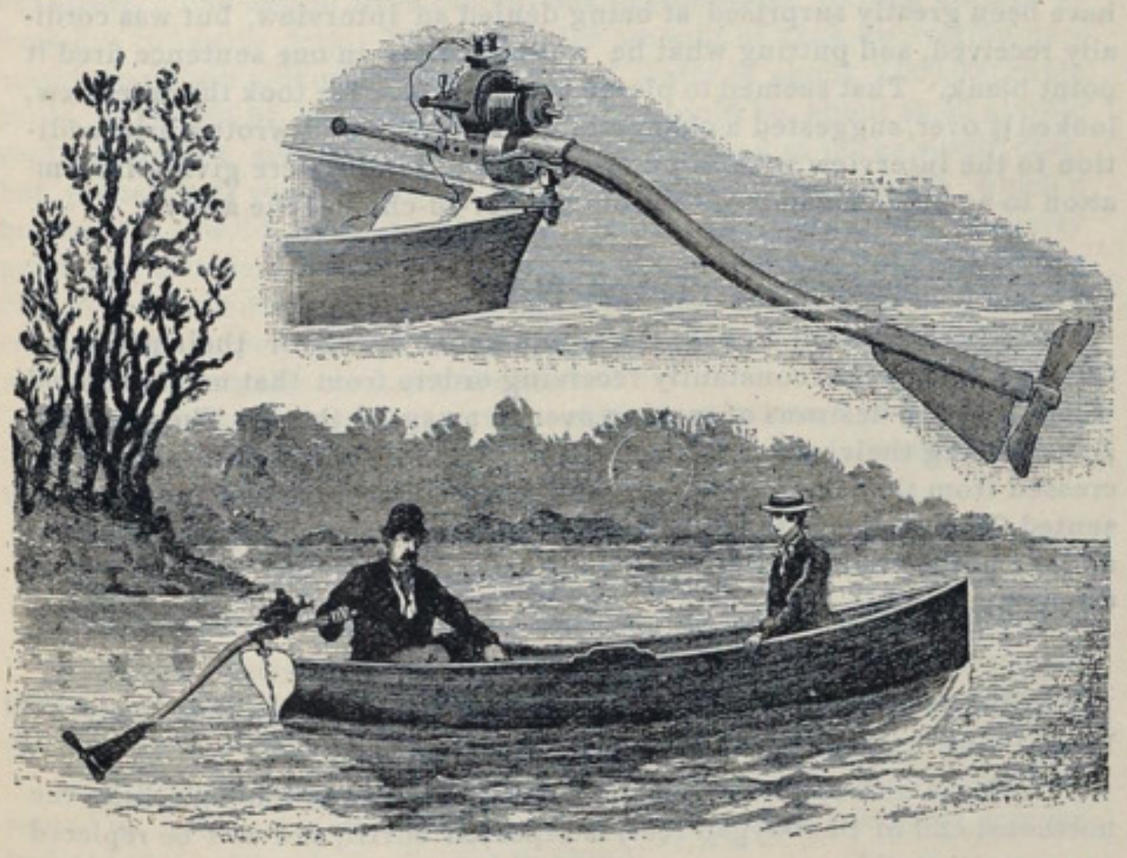
The steamer Atlanta fractured her shaft twelve miles from Grand Haven Sept. 27. She proceeded under slow check for six miles and signalled for a tug. The Soo City went out to meet her and took a line and towed her into port. The Atlantic then went to Manitowoc in company with the tug Arctic where temporary repairs were made until a new shaft could be put in. She has been running on the west shore since.

New Lake Superior Chart.

A correspondent gives us the following description of the new Lake Superior chart just published from surveys by the engineer corps of the army: "It differs from the navy chart in that it is up to date, larger scale and on the polyconic projection instead of the Mercator. The Mercator projection permits a given course to be plotted in a straight line, but to do this the scale of the map varies and it becomes a difficult matter to obtain correct distances between headlands. With the polyconic projection, which is the projection of the engineer chart, or Poe chart, a given course will plot in a slightly curved line, but distances between headlands can be taken off exactly by means of the scale. In other words the navy chart (Mercator) is a navigators' chart, while the Poe chart is a pilot's chart, and for that reason I believe it better suited for the needs of the lake interests. You can readily test the two charts as regards scale and you will see the difference. I am glad the engineer corps has been able to get out his chart because it will show the character of charts that the engineer corps can furnish as opposed to such compilations of doubtful accuracy as the navy has hitherto published. Most of the latter are simply copies of the old engineer charts, very imperfectly brought up to date, and on the Mercator projection, which is the correct projection for ocean charts, but for coast charts I do not believe to be of much use for 'headland to headland' sailing."

Portable Electric Propeller for Boats.

This invention which we illustrate, supplies a popular need, as it requires no special boat built for it, but can be used on any 10 to 18-foot boat and transferred from one to another in a few minutes, besides it



requires for its use no skilled labor. The propeller shaft has a rudder attached to it, so no other rudder is needed, and the whole motor, propeller, shaft and rudder weigh but 35 pounds and is moveable in every direction, even to being completely turned around into the boat, which facilitates the cleaning from weeds or grass, if necessary. The batteries used are the Crowdus primary, which received the highest award at the World's Columbian Exposition and can be re-charged by any one with material procurable at any drug store cheaply. Four of these batteries are necessary for an outfit, each weighing 25 pounds, and the four producing a power of about one-third of a horse power, but any battery can be used in connection with this propeller. The apparatus is well worth examination and can be seen at office of the owners of the Portable Electric Boat Propeller Co., 136 Liberty street, New York. For yacht tenders, pleasure boats, or for fishing and shooting, they certainly fill a want, as in a clear way it will run itself with no attention. To have a mode of propelling a boat that does not need a special one built for it and whose power contains nothing to endanger life, is what has long been sought.

Ancient Marine Insurance.

Fairplay of London prints the following story of marine insurance in ancient times, and another, not quite so ancient but authentic is appended:

In the city of Babylon, at the place where the scribes assembled together for the receipt of premium, were some men who trafficked, and who said unto those sitting around, "Insure this merchandis of our friends which passeth from place to place by sea in ships." Thereupon the scribes took pens into their hands and the traffickers entreated them earnestly, crying unto them "Write quickly." And, lo, when the scribes did as was asked of them the traffickers rejoiced and sent word unto their friends, who made reply, "We have more merchandise which goeth by sea unto far countries, yea, even unto the ends of the earth. Have converse, therefore, with the men whose names ye tell us of; peradventure they will again give heed when ye cry unto them. But see ye that they have smaller tribute."

And it came to pass that Arriolus, of Sedjusalem, one of these traffickers, journeyed to another land and sought out there the abode of one of the merchants who had dealings with the scribes of Babylon. Speaking with soft words unto him he said, "Sir, I come to do thee service. Let thy commands be sent to me in Babylon, and not to Vaporius, who trafficketh there also, and thy substance shall be greatly increased, for the tribute which the scribes require of thee will be less when thou seekest the work of their hands through me than what thou hast paid unto them aforetime." Then the merchant spake and said, "Lo, these many years have I known Vaporius, and he hath served me well. I know not thee. Behold there is the door. Depart, I pray thee, and come not back." And Arriolus went his way lamenting.

Now when the tidings of Arriolus' journeying became known unto Vaporius he waxed exceeding wroth, casting things from his hand violently on the ground, and saying: "Why hath my fellow trafficker gone to the land beyond the sea unto the house of him who is my friend and beseeched of him to put me away from his favour, and why hath he sought to gain the merchant's tribute for his scribes and himself? I will recompense Arriolus for this his iniquity. Yea, verily, he shall suffer." Then raising his voice he spake aloud to those around, saying: "Scribes and traffickers: Know ye all that Arriolus hath essayed to do me wrong. Now, therefore, henceforth where I find that tribute passeth through through his hands I will seek those who pay that tribute and they shall pay less." And those who heard the words of Vaporius shouted in a foreign tongue: "Goodole chapibus; letim avit otibus."

And then again one of the scribes who dwelt by an inland sea, and had taken many risks and trafficked through a concern that went not beyond the inland sea, girded himself up when the ice was upon the inland waters and he skimmed the cream of the risks and put them in his girdle and took ship for a far country, where three per cent. is the dream of those that have bags of gold to invest. He went into this land whose inhabitants regard the waters from whence he came as a mill-pond upon which when night overtaketh a craft they put a pike-pole down into the mud and tie to and sleep soundly until dawn. When the risks of the merchandise on this pond was mentioned they bit at it like unto a fish of the species sucker, which swalloweth the bait and hook. It was like picking up golden sesterces on the pavement. The scribe returned without the risks in his girdle, but the journey was accomplished with much profit. But about the time it became to be noised abroad, lo there was murmurs of a mighty kick, and his brother scribes did go out behind their habitations and whet up their daggers on their grindstones. Then on these inland seas a mighty tempest arose and swallowed up some of the ships which had been assured in the far country, and they and their merchandise were no more, but their owners were recompensed for had they not assurance for — per cent., — per cent. cheaper than they had such assurance before. But his brother scribes began to shout "The wrath of the gods," and their courage revived, and they sent unto this far country and they said, "Aha, wilt ye have the skim-milk with the cream." And forthwith they of the far country began to churn to find, if possible, how much butter there was in the transaction. And now there is a watch set by the shore, and if this scribe embarketh again, verily, there will be war.

Buoys and Lights for the New Canadian Lock.

Now that the Lake Superior grain trade is at its height the American locks at the Sault will be taxed to the utmost and captains will be interested in the following sailing directions, etc., for entering and leaving the new Canadian locks. They were furnished to the REVIEW by the courtesy of Lieut. Col. W. P. Anderson, chief engineer of marine and fisheries.

The canal is cut through red sandstone rock on the north or Canadian side of Sault Ste. Marie, about 4,000 feet north of the existing United States canal. The cut is straight and is 5,900 feet long between the extremities of the cribwork approaches. The canal prism is 156 feet in width at the surface, 143 feet at the bottom, and the water is twenty-two feet three inches deep. There is one lock, which is 900 feet long by 60 feet wide, with a depth on the mitre sill of twenty feet three inches. The lift is about 18 feet, varying somewhat as the waters above or below the canal are affected by drought, rain, wind, etc. Outside the canal, at each end, a channel eighteen feet deep by 250 feet wide has been dredged connecting with the American channels.

The approaches are marked by spar buoys. The dredged channel east of the canal is indicated by eight red and four black spar buoys. The lowest red spar buoy, near Plummer's dock, is distinguished by being surmounted by a slatwork cone, and the lowest black spar buoy, opposite the International dock, is surmounted by a slatwork drum. Below the easternmost black buoy there is at least fifteen feet water across to the wharves on the American side of the river, and vessels desiring to cross the river need not keep close to the red buoys any farther east. Above the canal there is an octagonal timber crib surmounted by a day beacon built on the starboard side of the channel off Davignon point to mark the only turn above the canal. There are two red buoys between the end of the canal embankment and this beacon. There is a black buoy on the south side of the same stretch, and two black buoys to mark the turn opposite the beacon. Off Vidal shoal there are four red buoys. The outermost of these buoys is a square platform buoy on which stands a pyramidal slatwork surmounted by an inverted cone. On the port side of the channel are four black spar buoys. The platform buoy indicates a point where vessels upward bound can leave the dredged channel and make a course for Algoma Park light and where vessels bound down require to take the Canadian dredged channel.

It is intended to mark the dredged channel approaching the canal from the eastward by two electric arc lights shaded by red globes, placed in a prolongation of the axis of the dredged cut. These two lights in line will lead vessels from the American channel up the middle of the dredged approach to the east end of the canal. Further details of these lights will be given when established. The canal itself is marked by white electric arc lights established at regular intervals along both sides of the canal bank and cribwork approaches. A group of incandescent electric or white lights is to be placed on top of the beacon at the turn in the western approach to the canal, and an incandescent bright light on a pole is to be established on the eastern extremity of Davignon point. These two lights in one, N. E. ⅛ E., (N. 46° 25′ E.) will guide from the turn at the beacon through the middle of the dredged channel past Vidal shoal to the American channel. Further particulars of these lights will be given when established.

Vessels bound upwards should keep the usual course in making for the American canal until they bring the Canadian range lights below the canal in one bearing N. W. ½ N. (N 38° W. true). They should then follow the alignment of these lights, between the red and black buoys, until they reach the axis of the canal, due west. They moor to the cribwork at the north side of the entrance while waiting to go through the lock; after passsing through the lock and the upper end of the canal, their course will be W. ¾ S. (S. 81° 34′ W. true) passing 125 feet south of the beacon. On reaching the beacon they haul S. W. ⅛ W. (S. 46° 25′ W.) and rounding the westernmost of the two black buoys and keeping the range lights in one astern, pass up through the middle of the channel between the red and black buoys. After passing the red pyramidal buoy off the west extremity of Vidal shoal there is good water up to Algoma park light and vessels can make for that light. Vessels going down reverse these courses.

Lake Carriers' Association.

President Livingstone and Secretary Keep of the Lake Carriers' Association are in Washington conferring with Secretaries Lamont and Carlisle, and the new chief of engineers Gen. Craighill. They are urging that plans be made for a second canal at St. Clair flats. This would give one channel for up-bound and the other for down-bound boats. Another improvement they are urging is the widening of the Lime-Kilns crossing from 440 to 660 feet. As a menace to passing boats this channel is compared to the famous Hell's-gate of New York harbor. Although Hay lake channel has just been completed it is urged that it be widened. Both Secretary Carlisle and Secretary Lamont were on a trip up the lakes this year and the result is evidenced in the interest they are taking in these matters. Fortunately for those interested in raft towing restrictions Secretary Carlisle saw a broken raft during his trip and as a result he gave assurance of his co-operation in securing the passage of a law regulating this matter, including the adoption of a system of lights and signals. It will also make the owner of the raft responsible for all damage done other vessels. The light-house board has been called upon with reference to the establishment of new lights and other aids to navigation.

Wooden Sheathing a Success.

When Capt. E. M. Peck ordered the steel steamer Harvey H. Brown's bottom sheathed with oak before she left the stocks, there was a great deal of adverse comment. It would make her draw so much more and decrease her speed, so it was said. Notwithstanding she held her own with her sister ship and other boats in general, but recently she rolled over a rock in the Sailors' encampment. Every time an ordinary steel steamer does this, it requires a week or ten days in dock and from $10,000 to $15,000 worth of repairs to make her as good as new again. After unloading 3,000 tons of ore she went into the dock of the Detroit Dry Dock Company, who built her. The underwriters' agent examined her and said that but for the wooden sheathing some $10,000 to $15,000 worth of repairs would be required, and as it is about $1,500 will cover the damage, and two days in dock was all that was necessary. When she first came out it was understood that a reduction in insurance of 25 cents would be made. Whether this was done or not it seems that the outcome of this accident would lead the underwriters to make pretty liberal inducements to have owners adopt this wooden sheathing.

Instead of having several frames and plates broken the Brown stood an actual damage to her steel bottom of two very slightly bent plates, and nothing will have to be done at all to these. The boat struck the rock about amidships on the port side and close to the keel. One plank bore the brunt of the contact. This plank, about fifty feet long, is twisted and torn into a jagged mass, and a deep hole at its after end shows that the point of the rock became embedded in the wood and the force of the on-moving boat turned it over until it lay on its flat side. Two planks that lay parallel with it were damaged on the edges and had to be removed. All are now on exhibition in the yard of the dry dock company.

Although very military Col. O. M. Poe was easily approached. Shortly after the accident to the Sault lock some three years ago, a representative of the REVIEW went to Detroit to get some drawings from his office for reproduction and secure an interview with Gen. Poe. He arrived Wednesday and the paper went to press on Thursday. The drawings were secured and engravings ordered to be ready by the time the boat left that night. But Gen. Poe was absent from the city although expected to return at any time. As the afternoon wore on and he did not appear the representative gathered all the available information on the subject and to make it effective put it in the form of an interview, making two copies, intending to leave one with a request to correct any errors by wire. Before the boat left he learned the general had arrived on a late train and had gone to his home. The young man would not have been greatly surprised at being denied an interview, but was cordially received, and putting what he wanted to say in one sentence fired it point blank. That seemed to please the general. He took the interview, looked it over, suggested a change in one sentence and wrote a brief addition to the interview with as much courtesy as if he were giving information to an aide-de-camp of the commander-in-chief of the army.

Trade Note.

The Bertram's Oil Polish Co. wants a live agent for their polish in Chicago. They are constantly receiving orders from that neighborhood which they are desirous of turning over to an agent there. They say that since placing their advertisement in the REVIEW their orders have increased from the lake region. We can recommend some good, well represented Chicago house to apply for this agency. Marine supply houses at all lake ports would do well to write them. Address Bertram's Oil Polish Company, Boston, Mass.

Notice to Mariners.

Notice is hereby given that the wreck of the schooner Kate Kelly, off Wind Point, Racine Point, Wisconsin, has been removed.

Notice is hereby given that the red third class can buoy marking the northeast end of Sheboygan reef, is reported adrift, and will be replaced as soon as possible.

Next year the United States government will have two large dry docks for docking naval vessels. The dimensions are: Brooklyn dock No. 3, now in course of construction, length at top, 670 feet; length at bottom, 626 feet 8 inches; breadth of entrance, 105 feet 3 inches; depth of sill, 28 feet; Puget Sound dock, length at top, 650 feet; length at bottom, 618 feet 6 inches; breadth of entrance, 92 feet 8 inches; depth of sill, 30 feet.

Buffalo Harbor Facilities.

The Buffalo Courier devotes a column and a half to statistics showing the importance of that city as a lake port and stirring up the question of increasing harbor facilities. One of the disadvantages in entering the harbor is the fleet of excursion boats lying at the foot of Main street. Of this and other matters a prominent vessel owner of Buffalo speaks offering suggestions for improvement and giving advice that may apply in general to other Lake Erie harbors. The following is quoted from his interview:

"The government is spending a great many millions of dollars in deepening the straits and rivers connecting the great lakes. The work is well under way and in a very few years will be completed. In anticipation of the completion of this work a number of large steamers have been built and more are being built to take advantage of it. With a sufficient depth of water and adequate facilities for handling cargoes, the larger the vessel the cheaper she can carry freight, and the ports that provide facilities for handling the traffic will get the business.

"If the creek were wide enough to accommodate the largest class of vessels it is doubtful if the depth of water could be very much increased, for the reason that most of the docks, elevators, etc., were built when the largest vessels did not require a greater depth of water than about 12 feet, and to deepen the present harbor to 20 feet would jeopardize the safety of most of the structures along its banks.

"The government engineers have reported in favor of extending the government breakwater south to Stony point, by means of which a harbor of ample capacity for any possible lake commerce Buffalo may have in the future will be provided, and by means of the Buffalo creek railroad all other roads entering Buffalo may have access to any piers or wharves that may be built; and as there is no rock bottom, any excavating or dredging will not be expensive.

"It has been proposed that the city should build docks at the foot of Georgia street, to accommodate the excursion business. To me this location seems unsuitable for many reasons. The expense of acquiring title to the property and building a dock would be considerable, and it could not be conveniently reached, except by crossing the numerous tracks of the New York Central at the foot of Georgia street at grade.

"The city already owns the land on the lake front from Jersey street to Porter avenue, and it has been decided to move the Porter avenue bridge to Jersey street and to continue it over the New York Central tracks at that point, thus giving access to the water side without crossing the railroad tracks at grade. If a retaining wall were built out in the water as far as the city's rights extend and the space between the retaining wall or wharf and the shore line filled in, the value of the land thus reclaimed would be vastly greater than the cost of the improvement, and it would be an addition to the city's area of park land at a very little cost. The retaining wall or wharf would afford a safe and convenient landing place for excursion boats that would cost the city nothing for maintenance after it was built."

"What is your idea of providing a harbor for commercial purposes?"

"That is quite a question. It has been proposed that the city should acquire title to all the land on the water front from Georgia street to Jersey street. The depth from the surface of the water to rock bottom is from five to twelve feet. The estimated amount of rock excavatiou necessary to obtain a depth of twenty feet of water is about 1,000,000 cubic yards. The cost of such rock excavation would be about $2.50 a cubic yard. I can not give any estimate of what the land or docks would cost, but probably it would be fully as much more, in addition to which a breakwater would have to be built to protect the docks from westerly gales, and if it were all done, it would be equivalent to a donation by the city to the New York Central railroad, as that company would have a complete monopoly of the docks. No other railroad could reach them without crossing the tracks of the central."

Well informed vessel men are looking forward to a very large lake business the coming fall, when the same old blockades in Buffalo harbor will doubtless be realized in their experience again.

Around the Lakes.

A barge at Fort Benton, Mont., has been named the Razzle-Dazzle.

Steamboat Inspectors Danger and Vanliew of Port Huron revoked the license of Capt. Andrew Bonnah of the tug Richardson for violation of rules for pilots.

A Milwaukee firm of marine underwriters recently had a claim presented to them under the existing form of the marine policy for damage by lightning. The claim was not honored.

There has been some talk of the Lake Carriers' Association securing an ice crushing boat to keep the passages between Lake Superior and Lake Huron open a week or two longer than ordinarily. It is talk and nothing more.

Wheeler & Co., West Bay City, is planning to practically double the capacity of their yard and if the scheme is carried out they will have room to construct seven large steel vessels at one time. The shops will also be doubled in capacity.

At the next meeting of the lake underwriters it is very probable that standard requirements for electric ontfits for lake steamers will be adopted. It is expected that a standard equal to a naval standard will be required, and thorough inspection will be made of each plant.

The Globe Iron Works Company, Cleveland, is building two Scotch boilers for Lewis Nixon, Elizabethport, N. J. This is the first time marine boilers for vessels building on the coast have been built so far west. Although the Lake Erie Boiler Works, Buffalo, have built large numbers of them for coast work.

The Grummond Wrecking Co. has abandoned the contract to release the schooners Moonlight and Kent which went ashore near Marquette in the late big storm. The channels that were dredged to the stranded boats were rapidly filled by shifting sands whenever unfavorable weather compelled a temporary cessation of work.

The new steel steamer to be built by the Detroit Dry Dock Company will be according to Sinclair Stuart's channel system and under his superintendence. She will be 400 feet keel, 45 feet beam and 28 feet deep, with a water bottom 5½ feet deep. This is the first boat built by the Detroit company under special classification rules.

The following lake steamers were assigned numbers by the bureau of navigation during the week ending Oct. 5: Steamers—Katherine T. Wilbur, Oswego, N. Y., No. 161,077, tonnage, gross 54.81, net 37.28; Mae Martel, Grand Haven, Mich., No. 92,678, tonnage, gross 38.89, net 26.45; Simon J. Murphy, Milwaukee, Wis., No. 116,684, tonnage, gross 1,380.55, net 1,103.03.

It is announced that the Huyett & Smith Manufacturing Co., Detroit, have transferred their interests to the American Blower Company. The personnel remains the same, with the exception of the withdrawal of Mr. W. D. Smith, vice president. Mr. Huyett not having been connected with the company for more than ten years, the name was meaningless, and the necessity of a change apparent. The new company will continue to furnish blowers for hot draft apparatus on lake steamers.

The 54-ton schooner Nellie Duff, hailing from Detroit and bound from Pelee island to Cleveland, loaded with gravel, sank two miles off Lorain harbor. The captain and two members of the crew were drowned. A heavy sea was running and the schooner sprung a leak and went down while trying to make Lorain. Capt. Peterson and seaman John Hagerman, both of Pomeroy, O., and an unknown sailor hailing from Cleveland were drowned. She was owned by Capt. Peterson.

Handsome Photographs of Lake Steamers.

For some time the REVIEW has been planning to secure photographs of lake vessels in motion, giving an artistic marine scene as well as a picture of the vessel. Arrangements have been completed and the first consignment has been received. They are 8 by 10 inches on tea colored mounts and will be sent to any address. We have a number in stock and as more are being taken every few days we can furnish almost any of the modern freight steamers at $1 each. The following are on hand:

J. J. McWilliams,	J. N. Glidden,	Cherokee,	D. L. Leuty,
Yukon,	Wawatam,	Majestic,	F. L. Vance,
Colgate Hoyt,	Briton,	Chas. Hebbard,	Selwyn Eddy,
John Harper,	Pillsbury,	Saginaw Valley,	Forest City,
Gladstone,	Maritana,	S. S. Curry,	Wallula,
John V. Moran,	Malta,	H. J. Johnson,	Jim Sheriffs.
John Mitchell,	Quito,		

Send $1 to the MARINE REVIEW, 516 Perry-Payne Bldg., Cleveland, O.

Letters addressed as below remain uncalled for at the marine post office, Detroit.

Blair, Jos. 2	Jarvis, Z. J.
Brown, John E.	Kimball, Frank
Cross, John F. Ga.	Kerwin, Roy
Desatt, Frank	Richie, Mrs. Lucy
Fredericks, John	Richardson, M.
Gilbert, C. L.	Ryan, J. C. 3
Hensley, Capt.	Starkey, Frances D.
Hill, Fred C.	Telfer, Capt. P.
Jarvis, Zed	Thayer, A. N.

Wednesday the St. Louis of the American Line and the Majestic of the White Star Line started on a race from New York to determine which could get mail to London first. The St. Louis goes to Southampton and the Majestic to Liverpool, via Queenstown, where she leaves her mail. This gives the Majestic an advantage of 275 miles. The distance from Queenstown to London is 504 miles, which will be covered by a special train in fifteen hours and forty minutes, and the distance from Southampton to London is covered in two hours. This will give an opportunity to learn just what the St. Louis can do in the way of speed.

MARINE REVIEW

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department on June 30, 1895, contained the names of 3,342 vessels, of 1,241,459.14 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,-642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1895, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,755	857,735.00
Sailing vessels	1,100	300,642.00
Unrigged	487	83,082.00
Total	3,342	1,241,459.00

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
Year ending June 30, 1891	204	111,856.45
" " " 1892	169	45,168.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
" " " 1895	93	36,353.00
Total	747	334,634.28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

(From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			Suez Canal.		
	1894.	1893.	1892.	1894.	1893.	1892.
No. vessel pass'ges	14,491	12,008	12,580	3,352	3,341	3,559
T'n'ge, net registd	13,110,366	9,849,754	10,647,203	8,039,106	7,659,068	7,712,028
Days of Navigat'n	234	219	223	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

THE SUBJECT of local harbor improvement is agitatating both Buffalo and Cleveland, and there are outlines of recent plans in the REVIEW this week. In the interview of the Buffalo owner he shows that any attempt to deepen the river there would destroy the foundation of elevators and loosen the piling on which the docks are constructed. This, of course, is in consideration of an outside harbor. He also proposes a new dock for excursion boats. While the latter problem does not trouble Cleveland as yet it soon will. The Euclid beach project has been sufficiently successful to induce parties who were interested in that to lease a beach near Dover and next summer they will be running boats to the west. A small viaduct at the foot of Erie street will take care of this business when it grows. But so far as outlined the Cleveland plan seems to be the improvement of the present channel between Main street bridge and Center street. Lack of time prevents the presentation of figures showing that only about one-fourth of the traffic entering Cuyahoga river passes through this channel which it is proposed to improve. At least three-fourths goes into the old river bed. What is this tortuous channel above Main street to be improved for? Is it for the 20-foot channel? It can't be deepened that much without wholesale destruction of docks. Suppose this is done. There is nothing except one coal and one ore dock above this proposed improvement to which a 20-foot channel boats want to go. And these 20-foot channel boats are 400 feet long and it is doubtful if two of them could pass each other in the sharp bends, even if there was something to go for. If the channel is improved ore docks will be built up the river it is claimed. The property is too high to be bought for such purposes. Cleveland can not hope to compete for the ore trade when this 20-foot channel is completed unless an outside harbor is provided. And this is the reason. Huron, Fairport and Ashtabula are in position or can get in position with little expense to care for all ore receipts at the harbor entrance. Boats will be sent where they can get the best despatch and traveling up a labyrinth of a channel two or three miles, blocked with a half-dozen bridges is not conducive to this feature. There has been considerable talking about this plan and the marine interests in general have done very little to oppose it, but now that there is a movement to issue bonds there should be something said. Although nothing should be done to hinder or impede municipal progress. Let the city go on and spend all the money the council chooses in making the Cuyahoga puddle larger and capable of holding more sewage for a greater length of time, only, let it not be done in the name of lake commerce or under the guise of making the harbor more commodious or putting it on an equal footing with other harbors to receive this 20-foot channel busines. That would be expending money under false pretenses. It is not for a marine paper to advise or urge that this improvement be made or not made. This question seems to lie wholly within the precinct of a real estate periodical. And the improvement would not give real estate on the flats any permanent increased value—only a temporary one. Gentleman of the municipality, if you are anxious to dig some sand where it will count for lake commerce and benefit the city go down to the old river bed or to the inside of the breakwater. If you just want to spend your money and exercise your strength for fun, that part of the river between Main and Center streets is as good as any. But an odor of displeasure is liable to be kicked up over the matter, by tax payers, that will equal the Cuyahoga odor in August.

THE FACT that the steel schooner Tyrone parted from her consort ought to have no unfavorable influence on the introduction of steam towing machines and wire hawsers on the lakes. The accident was not due in any sense whatever to either the towing machine or the hawser. It was the patent hook by which the hawser held onto the steamer that broke. The captain of the Tyrone, which is in dry dock in Cleveland this week says that the machine was working very nicely in the storm and that just before the accident occurred that the machine was paying out the hawser some eight or ten feet, and whether it had stopped or was beginning to take up the slack he did not know, but a sudden pitch seemed to cause the accident, which was confined to the fastening of the hawser on the steamer. In bringing down the Tyrone a schooner went across the line, bringing its weight on the line, which scraped along the schooner's keel but was not damaged. The hawser is of an English make and every wire is tested before being made up. The captain of the Tyrone spoke in high terms of the towing machine, stating that when the seas were high the line paid out and thus eased the strain on the line from the pitching of the boat.

In General.

Commenting upon the remarkable system of electric lights on buoys that has lately been completed at the Gedney channel, off Sandy Hook, New York, Nature (London) notes that this channel is only 1,000 feet wide, and vessels have not, heretofore, been able to pass through it by night. The new system, however, provides a brilliant thoroughfare, lighted by ten incandescent lights of 100 candle-power each, and each on a buoy, about fifty feet long, and rising twelve feet out of water. The cable which conveys the electricity carries the pressure of 1,000 volts under water, and is six and one-half miles long, being the longest cable in the world carrying a high pressure current under water, and also the only one of its kind ever made. It consists of a copper conductor, insulated with gutta-percha, bedded in jute and sheathed with hard-drawn copper wire. The machines have an output of only 100 volts, but the current flows through a step-up converter, back of the switchboard, where it is converted into the right voltage, being thus perfectly safe to operate.

A note in Cassier's Magazine recalls some of the schemes advanced in earlier days for distributing Niagara's power. One inventor proposed that a tube be laid from Chicago to New York city via Niagara, and then, by turning the river into a monster turbine, he would compress air to about 250 pounds pressure per square inch in this tube. The tube was to be tapped at the cities along its line, and power furnished as required. As an improvement on this scheme, another mechanical genius suggested that the air compressing machinery be dispensed with as too complicated, and that the turbine be geared direct to a shaft which should be laid through the state of New York from west to east. From this shaft power could be delivered by means of belts or gears directly to the machinery in the factories along the line of the shaft. The suggestion carried more weight of metal with it than any ever made in connection with a mechanical construction, but the idea was not more absurd than thousands to be found in the history of the world's mechanical progress.

It is now a little more than three years since the German five-master Marie Rickmers, started from an English port on its first voyage, from which she never returned, disappearing without leaving a trace. Since that time only one sailing vessel of similar dimensions has been built, the French five-master La France. On June 8 the five-master Potosi was launched, and a short time ago started on her first voyage. This vessel is 426 feet 6 inches long, 52 feet 5 inches broad, and 32 feet 9 inches deep. She has a capacity of 6,150 tons, or 550 tons more than that of La France. Over 5,511,000 pounds of iron were used in her construction, and the vessel. which will make regular trips to the western coast of South America for saltpeter, can carry about 13,227 bags of this salt. For the transportation of the same quantity by rail 600 double cars would be required, which if coupled together, would make a train more than three miles long. The vessel can carry as many people as there are in a city of the size of Bremen.

The Cream of the Business.

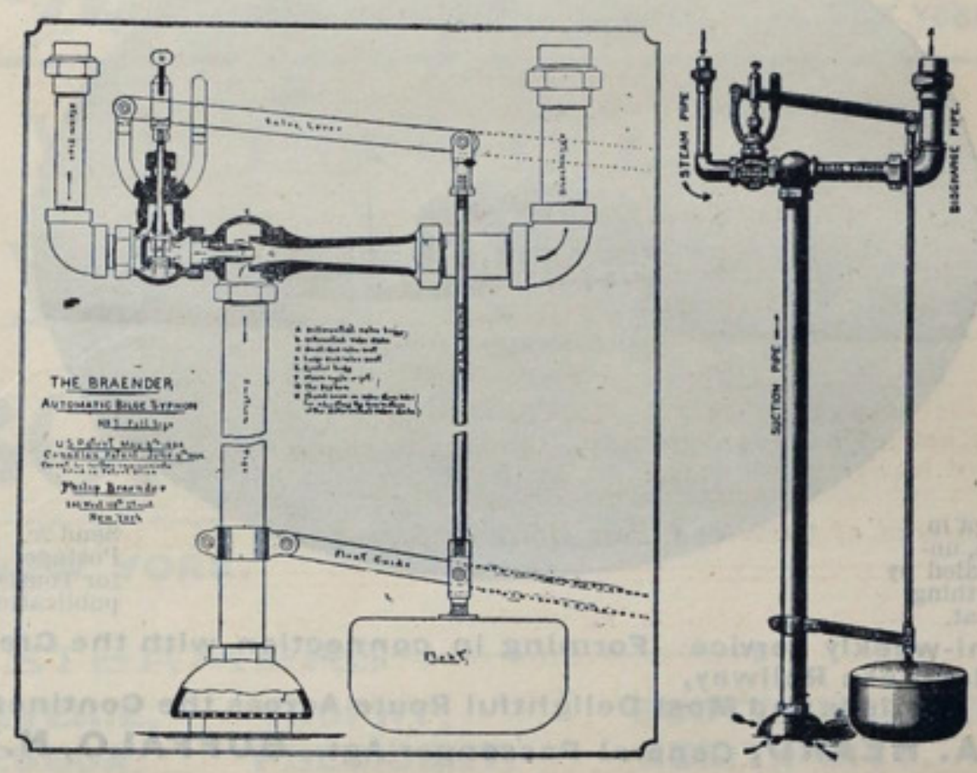
The American Ship Windlass Co. has never received a more thorough endorsement from the ship owners and ship builders than they have during the last six months. The following orders show that almost without exception the best steamships and the best class of vessels building throughout the country are continuing to call for these windlasses, the same as they have for the past thirty years. The list will show just what vessels now building, that have been contracted for since May, are to have the Providence machine:

1 No. 7 new style pump brake yacht windlass for barge Whitestone.
1 No. 3 vertical yacht windlass for yacht Alcedo, Philadelphia.
1 No. A vertical yacht crank windlass for yacht Huntress, built at Nyack.
2 No. 5 new style steam capstan windlasses and 2 No. E steam capstans for steamers Simon J. Murphy and Katahdin, West Bay City.
1 No. 3 pump brake yacht windlass for yacht Marietta.
1 No. 5 half pump brake windlass for barge No. 4, Norfolk, Va.
1 No. 2 steam capstan windlass U. S. light-house tender Pansy.
2 25-inch steam gypseys for U. S. snag boat Roanoke.
1 No. B steam capstan for tug B. B. Inman.
1 No. B hand capstan windlass, G. M. Josselyn & Co., San Francisco.
set of wharf drop gearing, Wilmington Steamboat Co., Philadelhpia.
1 steam towing machine for steel schooner Tyrone, built at Cleveland for the American Transportation Co.
2 No. E dock steam capstans for the Erie Coal Transfer Co.
1 dock steam gypsey for dredge building at Pittsburgh, Pa.
1 steam towing machine for barge No. 58 of the Standard Oil Co.
3 No. F. dock steam capstans for San Francisco.
1 No. 3 new style hand pump brake windlass and 2 No. B bar capstans for the Jackson & Sharp Co.
1 No. B friction gypsey pump brake windlass for yacht Princess.
1 No. 7 new style pump brake yacht windlass for barge Talisman.
12 sets of wharf drop gearing for the Boston & Philadelphia S. S. Co
1 No. 000 yacht crank capstan for yacht Helene.
1 No. 6 steam pump brake windlass for S. S. Curacoa building for Boulton, Bliss & Dallett.
1 No. 7 steam capstan windlass and 1 No. D Dock steam capstan for steamer building at Wyandotte, Mich., for the C. & B. Transit Co.
1 No. 3 new style steam capstan windlass for U. S. revenue steamer Walter Forward.
1 tug boat windlass with iron towing bitts for U. S. tug Unadilla building at San Francisco.
1 No. 00 bronze yacht crank capstan for yacht at Newport, R. I.
1 No. A steam capstan for steamer Bart E. L. Molo, Lyons, Iowa.
1 No. A steam capstan for river steamer for Oregon Railway & Nav. Co.
1 No. 5 new style hand pump brake windlass and 1 No. D bar capstan for bark Kryolite building at Parrsboro, N. S.
1 steam towing machine for tug International of the Philadelphia & Reading R. R. Co.
1 naval hydraulic capstan for the canal at Cascade Locks, Ore.
1 dock steam gypsey for the Phosphate Mining Co.
4 No. 8 new style steam capstan windlasses and 4 No. E. steam capstans for steamers Nos. 112, 113, 114 and 115 building at West Bay City.
1 No. 1 new style hand pump brake windlass for U. S. schooner Matchless.
3 No. 6 new style steam capstan windlasses, 3 No. E steam capstans, and 3 steam towing machines for barges Nos. 17, 18 and 19, Chicago.
1 No. 6 new style steam capstan windlass and 1 No. E steam capstan for steamer No. 20 building at Chicago.
1 18-inch steam gypsey for tug Margaret J. Sanford, Jersey City.
1 pair 6 by 8 inch engines for the Philadelphia Engineering Works for starting large stationary engine.
1 No. 4 hand pump brake windlass and 1 No. C bar capstan for schooner building at Rockland.
1 steam attachment to windlass on barge Felix.
1 No. 4 new style pump brake yacht windlass for yacht Freelance.
1 No. 3 hand capstan windlass for U. S. revenue bark Chase.
1 No. 8 new style steam capstan windlass, 1 No. E capstan aft and 1 No. E dock steam capstan, amidship, for steamer building at Cleveland.
1 No. 5 new style steam pump brake windlass for steamer building for the Hudson River Navigation Co.
1 No. 3 new style steam pump brake iron towing bitt windlass, 1 steam towing machine, and 1 No. F capstan aft, for tug building by the Wm. Cramp & Sons Ship & Engine Building Co. for the Philadelphia & Reading R. R. Co.
1 No. 5 new style steam capstan windlass for steamer building for the Montreal Transportation Co.
1 20-ton winch for the Winnsboro Granite Co.
1 No. 7 new style steam capstan windlass and 1 No. E steam capstan for steamer building by the Cleveland Ship Building Co. for the Zenith Transit Co.
1 No. 10 new style steam pump brake windlass, and 1 No. F steam capstan aft for steamer building for the Plant line.
12 yacht capstans shipped to G. T. Soley & Co., Liverpool, England, for different yachts in Great Britain.

In addition to the above orders the American Ship Windlass Company has sold hundreds of gypsey windlasses, hand capstans of all kinds, anchors, barge winches, one and two speed hand winches, center board winches, etc. The company has received within a week orders for over $6,000 worth of windlasses, capstan, towing machines, etc., and have orders enough to keep them until next summer hard at work. Among the orders is one from the Wm. Cramp & Sons Ship & Engine Building Co. for the large tug they are building for the Philadelphia & Reading R. R. Co., for a steam towing machine, the same as on the Lebanon, a steam tugboat windlass with iron towing bitts, and a capstan to go aft for handling the hawsers. They have also received the order for a large steam pump brake windlass to handle $2\frac{3}{16}$-inch chain, and a large steam capstan aft for handling the hawsers, for the steamship building by the Newport News Ship Building & Dry Dock Co., for the Plant Steamship line.

The Braender Automatic Bilge Syphon.

This is a simple, durable and inexpensive device, lately put upon the market by Philip Braender of 263 West 118th street, New York city for automatically removing bilge water from the hold of steam and sailing vessels. It has been endorsed by leading marine engineers in all parts of the country and will remove large quantities of water at a nominal cost for operation, either water or steam pressure being employed. It is entirely free in its construction from any possible disarrangement of its parts. This is an important and valuable feature.

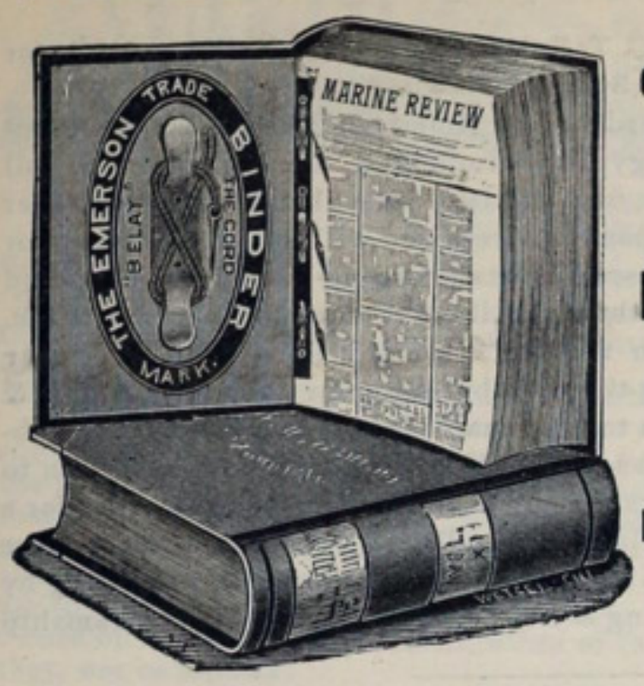


From Fig. 1 our readers will be enabled to gain a good idea of the general appearance and construction of this new bilge syphon. In Fig. 2 is shown the mechanism of the differential valve, with upper and lower seat, which forms so important a part of this device. This valve is made of brass with metal seats and ground joints. It requires no leather or other packing as the water to be removed does not pass through, the valve being used only to regulate the supply of water pressure. It is thus not exposed to injury or liable to stick or clog.

The float rises when sufficient water has accumulated in the vessel to call for the services of the syphon and in so doing brings a tension through the lever and its connections upon the valve which opens suddenly, admitting the water under pressure through the supply pipe. The water being forced through a small opening causes a vacuum or suction and draws the accumulated water under pressure, forcing it and the supply water through the discharge pipe, and thus continuing until all the water accumulated is removed.

As the water is discharged the float descends to nearly its lowest position, bringing the differential disks of the valve to a position from which the steam or water pressure suddenly shuts the valve and the syphon ceases pumping until sufficient water is again accumulated.

The amount of free movement of the differential valve is regulated by the space in the valve stem yoke in which the lever has full play. This space is in turn regulated by the thumbscrew H, (see Fig. 2) in valve stem, which, not being connected with the lever, allows the vessel in which the bilge syphon is used to roll and pitch without in the least affecting it, until the requisite height has been reached by the bilge water accumulating in the hold. The Braender bilge syphon has many points of excellence. It is made in three sizes, with a capacity per hour at 50 pounds steam pressure of from 1,500 to 3,000 gallons.



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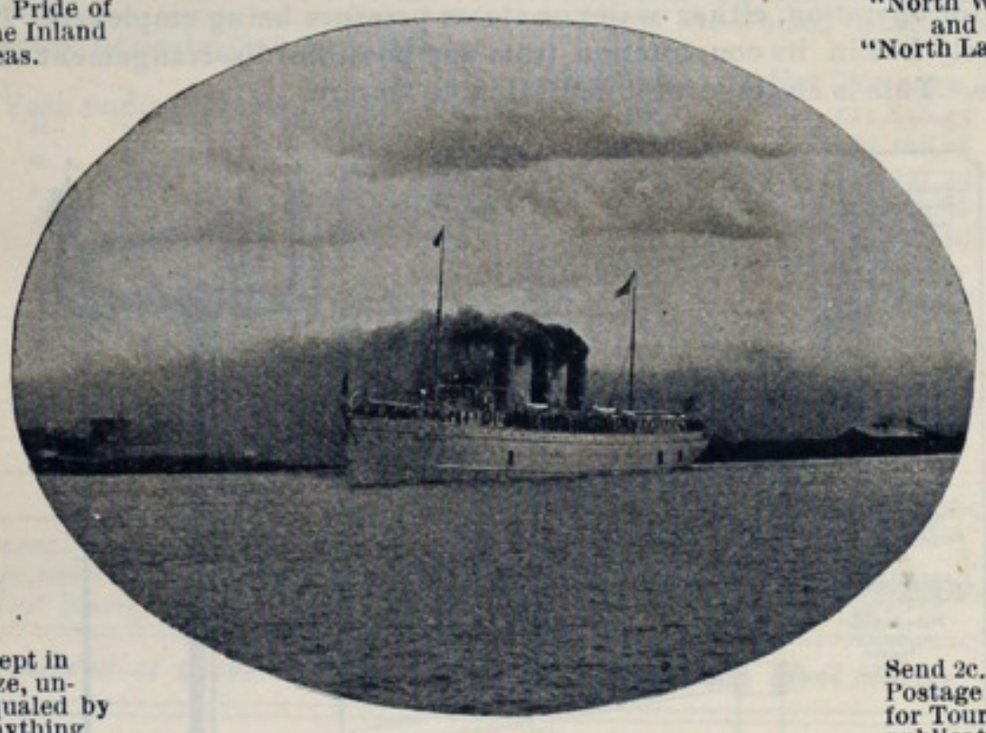

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Width:
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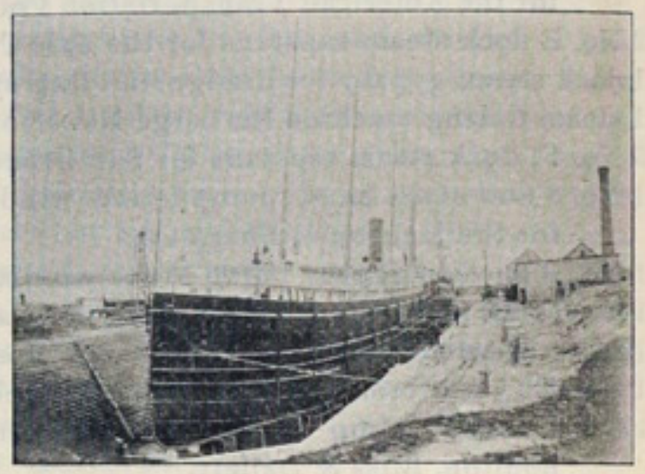
Bottom, 55 "
Gate, 62 "

Depth:
To Floor, 20 ft.
To Sill, 18 ft.
On Blocks, 16 ft.



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THIS IS THE NEAREST MODERN DOCK TO THE SAULT OR MACKINAW.

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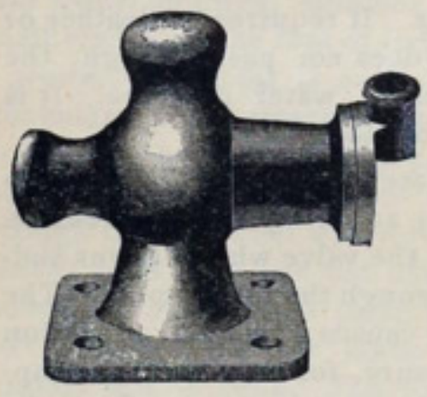

Takes the place of wooden or iron bitts and forms a Combination Bitt and Winch. Takes up less room than the ordinary bitt. Can be used to great advantage as a Windlass or Sheet Holder on Yachts. An examination will convince you of the many uses to which it can be put.

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THE ENOS SHEET HOLDER CO.
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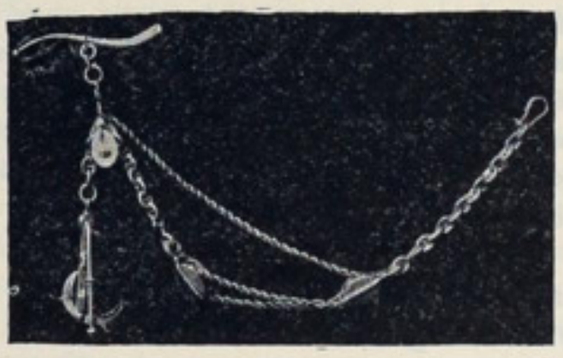

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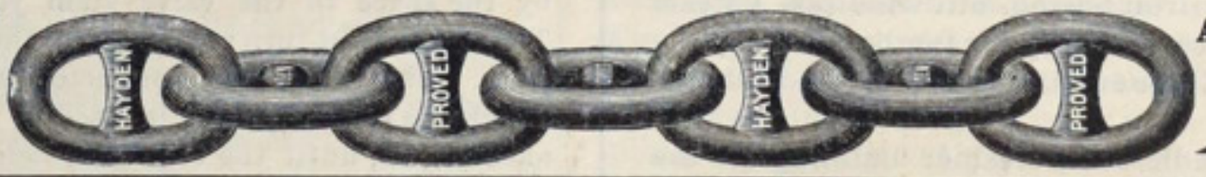

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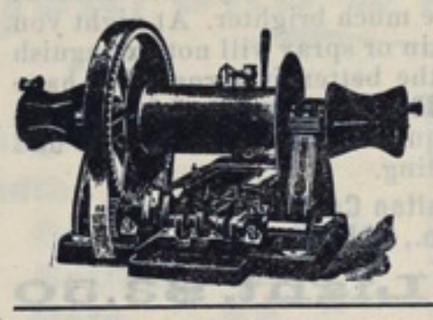

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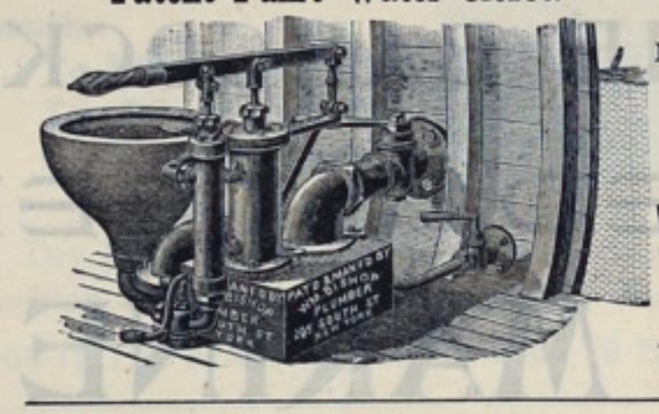

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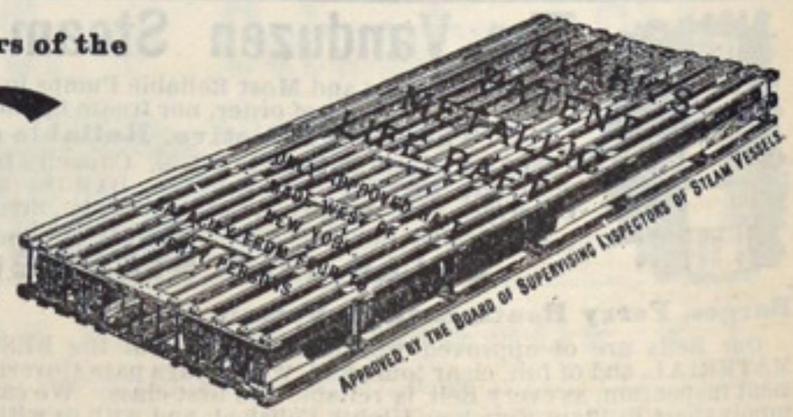

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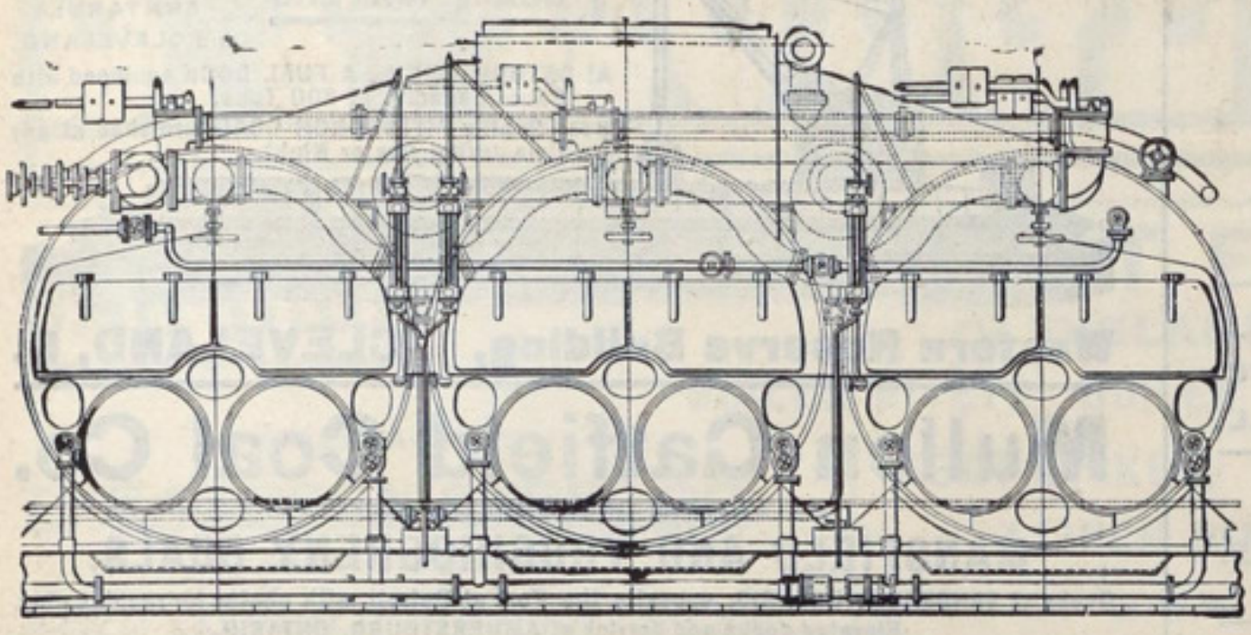

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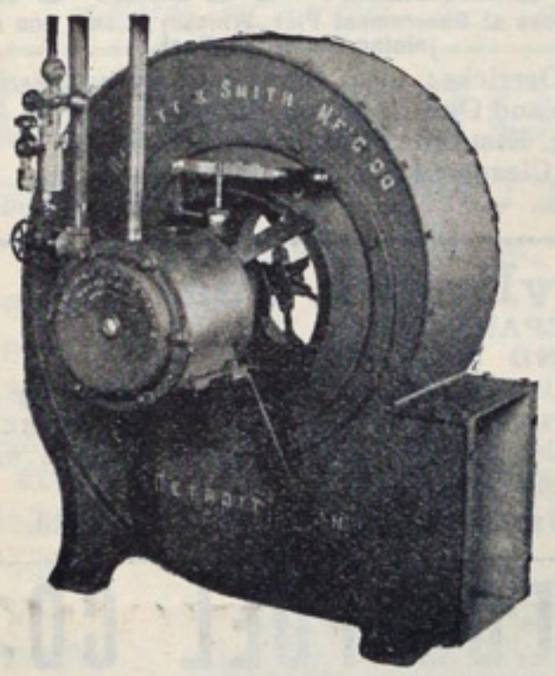

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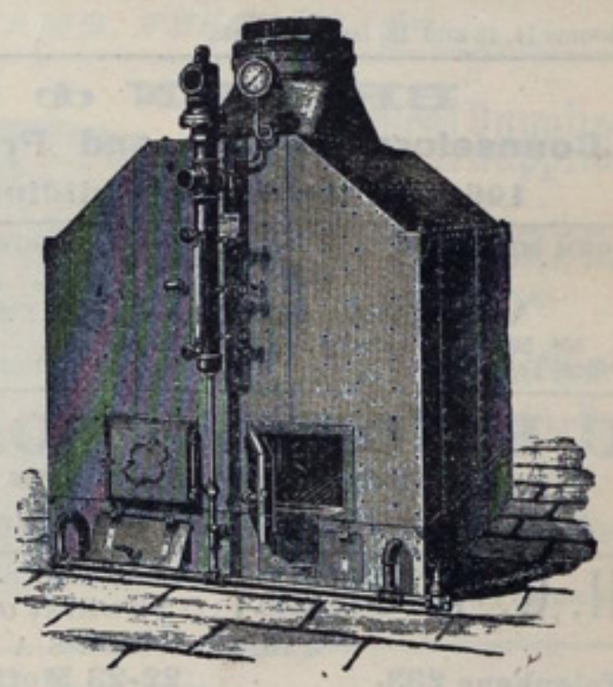

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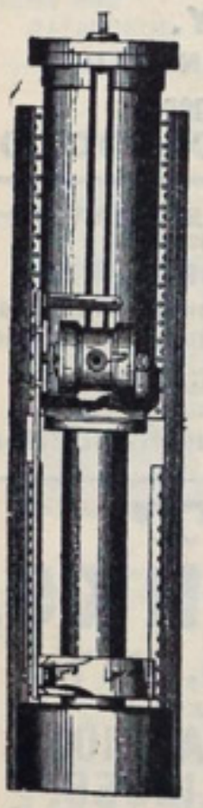

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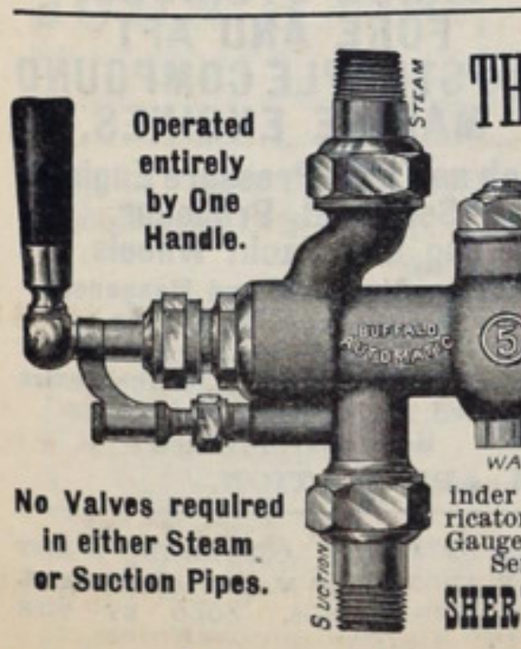

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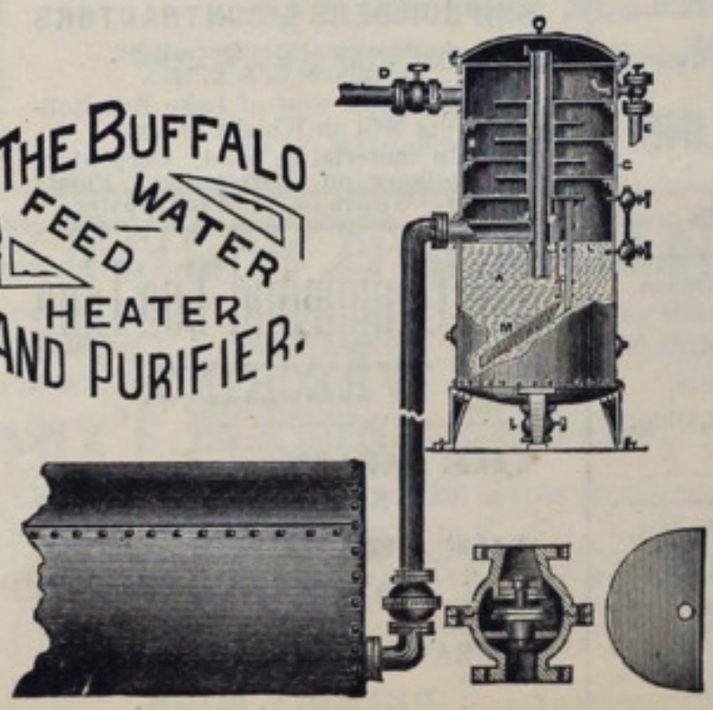

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A.—Settling chamber.
B.—Boiler.
C.—Feed pipe to boiler.
D.—Steam pipe.
E.—Water supply pipe.
F.—Check valve.
G.—Spray disks.
H.—Spray chamber.
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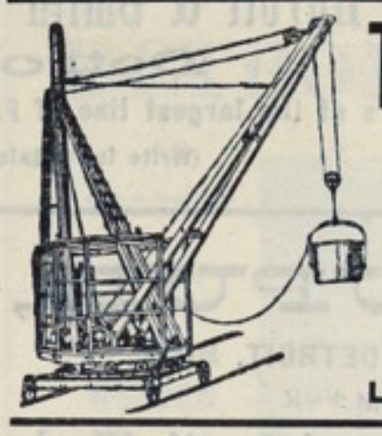

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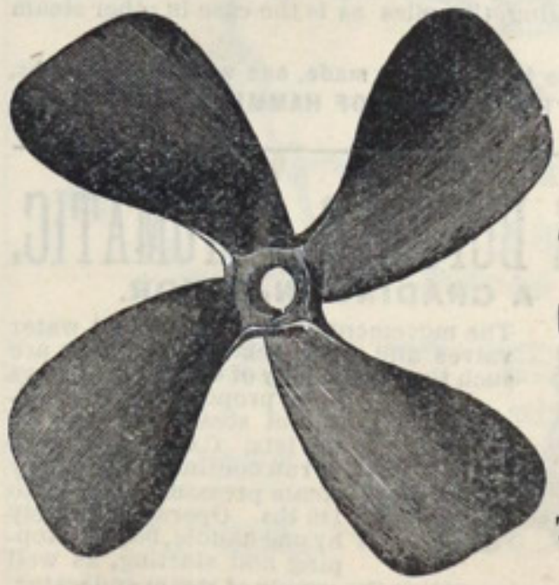

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